Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

stood by referring to Figure 1. The three concentric circles represent respectively the orbits of the Earth, *Jupiter* and *Saturn;* the small ellipse, part full, part dotted, the present orbit of the comet, while the two large ellipses, with the shaded space between them, the possible orbits of the comet before the great disturbance by *Jupiter*, in 1886. All these various paths for the comet are tangent to one another at the point of closest approach to the orbit of *Jupiter*, namely, *P*. This figure shows at a glance the great change that took place in the motion of the body.

"The heavily drawn portion of the small ellipse represents that part of the comet's path which it was actually seen to describe during the years 1889 and 1890. The remainder of this curve and the large ellipses were determined by tracing the comet backward step by step: such curves are entirely theoretical. The still outstanding uncertainty in the present orbit of the comet is so slight that it cannot be represented in the diagram. But unfortunately we cannot speak so definitely in regard to the orbit before 1884; the uncertainty is here much magnified and is clearly shown in the diagram.

"All that we can definitely say at present is that previous to 1884 the comet was traveling about the Sun, in an ellipse of about 31 years' period; that its path lay somewhere within the shaded portion of the figure; that during nearly a century this path was undisturbed. In whatever one of these various paths the comet was traveling it reached the point of tangency in the summer of 1886; at this same time *Jupiter* arrived at the corresponding part of its orbit, and the comet was gradually drawn from the large to the smaller ellipse. In this smaller ellipse it will continue to travel for a number of years, returning to perihelion in the first part of November, 1896. It should be first seen by the aid of the LICK telescope in May, 1895, and with medium sized instruments in the spring of 1896."

THE PASSAGE OF COMET V, 1889, THROUGH JUPITER'S SATELLITE SYSTEM, BY DR. CHARLES LANE POOR.

[Abstract of papers in *Astronomical Journal*, Nos. 302 and 309.]

"In 1886, *as above stated*, the comet passed very close to the planet *Jupiter;* probably within the orbit of the fifth satellite. Exactly how close the two bodies were at any given time is impossible to say; the uncertainty introduced through the original

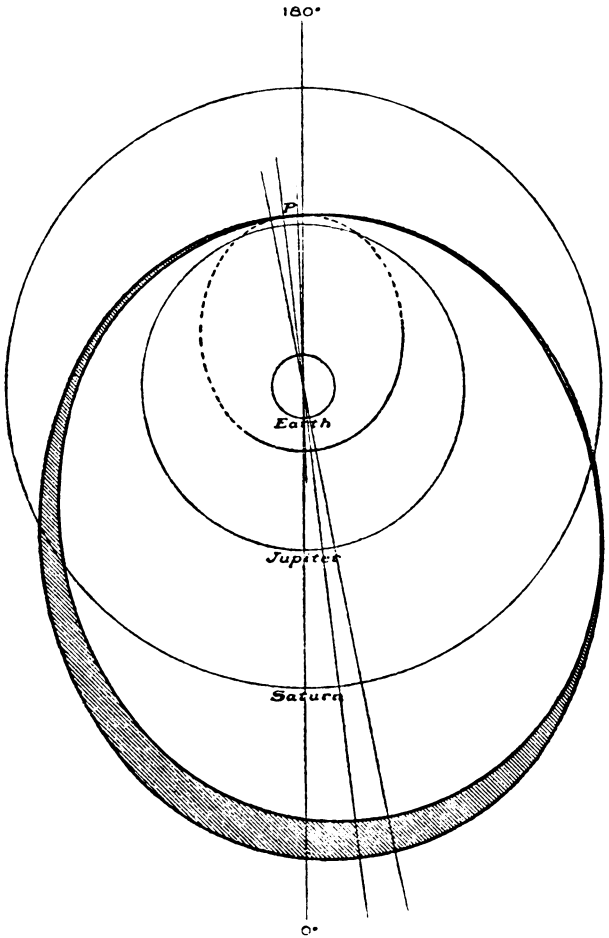

FIG. 1.

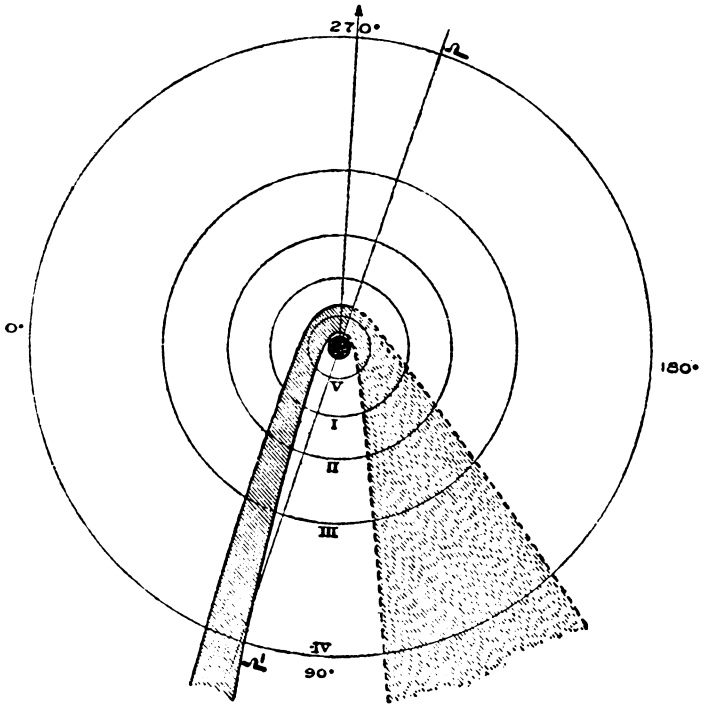

FIG. 2.

observations here becomes very prominent and precludes many interesting investigations. We can, however, readily place limits within which the comet certainly passed. It may be stated quite definitely that the comet passed the center of the planet at a distance not greater than 3.65 and not less than 1.00 radius of the planet itself. In other words, the center of the comet may have grazed the surface of *Jupiter*, and it certainly approached that surface to within 2.63 radii of the planet, or only 112,300 miles.

"In Figure 2 I have tried to represent what actually occurred. The five satellites of *Jupiter* revolve about that planet in ellipses differing but slightly from circles, and all lying nearly in the same plane. In Figure 2 we are supposed to be looking down upon this plane and to see these satellite orbits in their full size. The orbit of the comet was in a plane inclined nearly 70° to this, and intersecting it in the line ☊, ☊′. The projection of the comet's path on the plane of the satellites' orbit is given, and, as the actual path is unknown, I have drawn two curves between which the true orbit is certainly known to lie. The most probable path of the comet is a curve about midway between the two. It must be understood that during the time the comet was thus moving about *Jupiter* that body was in rapid motion itself in the direction of the large arrow, and it carried with it the entire system, satellites and comet.

"A careful inspection of the figure will show that the comet rose up suddenly from below the plane of the satellites' orbits, crossing it nearly at right angles, then passed upward and almost directly over *Jupiter*, and then gradually descended and finally passed below this orbitial plane again. So that, as the comet neared *Jupiter*, there could be no close approach to any of the satellites, excepting at the point where it passed through the plane of their motion. But, on the other hand, as the comet receded from the planet, it hovered over the satellites, and close approaches might occur, provided that the satellites were in the proper places at the right time.

"A careful investigation of all possible positions of the comet and of the satellites show that a collision was impossible; that the comet did not even approach near enough to any one of the four large satellites to cause the slightest change in the relative motion of the nucleus about *Jupiter*. Such a collision, or, at least, a close appulse, has been repeatedly invoked, to account for the observed disruption of the comet. (The comet, as observed, consisted of four separate parts.) * * * *

"There are many interesting problems connecting this comet with the fifth satellite of *Jupiter*. There is certainly great probability that the satellite passed directly through the comet; the mean path of the comet intersected that of the satellite, so that a direct collision was possible. Unfortunately the slight uncertainty in the comet's motion is here complicated by an additional uncertainty in the motion of the satellite, which renders it impossible to say definitely that a collision did or did not take place. It is possible, therefore, that the observed disruption of the comet was caused by the action of the satellite. But, all things considered, it is more probable, I think, that it was caused by *Jupiter* itself.

"*Jupiter* differs greatly from a sphere; its ellipticity being one-seventeenth. Hence, in treating of its action upon the comet, the shape of the planet must be taken into account. An investigation shows that the introduction of terms depending upon the shape of the planet caused little or no difference in the actual motion of the nucleus about the Sun. On the other hand, we find in the unequal attractions, due to the non-spericity of *Jupiter*, on the various parts of the comet, when at perijove, a ready explanation of the observed disruption.

"Among the many interesting problems yet to be fully discussed is this entire question of the breaking up of the comet; as well as the possibility that a portion of it was permanently drawn into the Jovian system, thus forming a new satellite or satellite ring."

THE VARIATION OF TERRESTRIAL LATITUDES, BY DR. S. C. CHANDLER.

" At the meeting of the Boston Scientific Society, on March 27, Dr. S. C. CHANDLER presented a report of progress of his investigation of the Variation of Latitude. Dnring the past six months he has been engaged in the reduction of POND'S observations made more than half a century ago at Greenwich, England. In this work he has been assisted by Miss WENTWORTH and Miss COBB, graduates of Boston University, whose skill in the discussion of the problems before them is worthy of much praise."

"The axis of the earth which we imagine to connect the